نام و نام خانوادگی ...امیرمحمد باباران‌مهر... پاسخنامه تشریحی تکلیف شماره ...۱۶... کلاس ...دوازدهم تجربی... B

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الف) $\cos 2x = 3\sin x - 1 \rightarrow 1 - 2\sin^2 x = 3\sin x - 1 \rightarrow 2\sin^2 x + 3\sin x - 2 = 0$

$= (\sin x + \frac{4}{2})(\sin x - \frac{1}{2}) = 0$ ، $\sin x = -2$ غ‌ق‌ق ، $\sin x = \frac{1}{2} \rightarrow \boxed{x = 2k\pi + \frac{\pi}{6},\ x = 2k\pi + \frac{5\pi}{6}}$

ب) $\cos 2x + \cos x - 2 = 0$ ، $2\cos^2 x - 1 + \cos x - 2 = 0$ ، $2\cos^2 + \cos - 3 = 0$

$(\cos + \frac{3}{2})(\cos - \frac{2}{2}) = 0$ ، $\cos = -1/5$ غ‌ق‌ق ، $\cos = 1 \rightarrow \boxed{2k\pi}$

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الف) $\sin^4 x - \cos^4 x = \sin 4x \rightarrow (\cancel{\sin^2 x + \cos^2})(\sin^2 x - \cos^2) = 2\sin 2x \cos 2x$

$\cancel{\sin^2 - \cos^2} = 2 \times \sin x \times \cos x \times (-1)(\cancel{\sin^2 - \cos^2}) = \sin x \times \cos x = -\frac{1}{2} \rightarrow$

$\frac{1}{2}\sin 2x = -\frac{1}{2} \rightarrow \sin 2x = -1 \rightarrow \boxed{2k\pi + \frac{3\pi}{2}}$

ب) $2\cos^2 x + 2\sin x\cos x - 1 = 0 \rightarrow \cos 2x + \sin 2x = 0$ ، $\cos 2x = -\cos(\frac{\pi}{2} - 2x)$

$2x = -2k\pi - 2x \rightarrow 4x = -2k\pi \rightarrow \boxed{x = \frac{-k\pi}{2}}$

$2x = -2k\pi + 2x \rightarrow \times$

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الف) $\cot x\,(2\cos x + 1) = \frac{1}{\sin x} \rightarrow \frac{\cos x}{\sin x}(2\cos x + 1) = \frac{1}{\sin x}$ ، $2\cos^2 x + \cos - 1 = 0$

$(\cos x + \frac{2}{2})(\cos x - \frac{1}{2}) = 0$ ، $\cos x = -1 \rightarrow \sin x = 0$ غ‌ق‌ق (مخرج صفر)

$\cos x = \frac{1}{2} \rightarrow \boxed{x = 2k\pi \mp \frac{\pi}{3}}$

ب) $2\sin^2 x - \sin x\cos x + \cos^2 x = 2 \rightarrow 2 - 2\cos^2 x - \sin x\cos x + \cos^2 x - \cancel{2} = 0$

$-\cos^2 x - \sin x\cos x = 0$ ، $-\cos x(1 + \sin x) = 0$ ، $\cos x = 0 \rightarrow \boxed{2k\pi \mp \frac{\pi}{2}}$ ، $\sin x = -1 \rightarrow \boxed{2k\pi + \frac{3\pi}{2}}$

اشتراک $\boxed{2k\pi \pm \frac{\pi}{2}}$

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الف) $\cos(\frac{\pi}{4} + x)\cos(x - \frac{\pi}{4}) = \frac{1}{4} \rightarrow \cos(\frac{\pi}{4} + x)\sin(\cancel{\frac{\pi}{2} - (-x + \frac{\pi}{4})}) = \frac{1}{4}$ ، $\frac{\pi}{4} + x$

$\frac{1}{2}\sin(\frac{\pi}{2} + 2x) = \frac{1}{4} \rightarrow \cos(2x) = \frac{1}{2} \rightarrow 2x = 2k\pi \pm \frac{\pi}{3} \rightarrow \boxed{x = k\pi \pm \frac{\pi}{6}}$

ب) $\cos(2x - \frac{\pi}{9}) = -\sin 2x \rightarrow \sin(\frac{\pi}{2} - (2x - \frac{\pi}{9})) = -\sin 2x$

$\sin(-2x + \frac{7\pi}{18}) = -\sin 2x \rightarrow \sin(2x - \frac{7\pi}{18}) = \sin 2x$

$2x - \frac{7\pi}{18} = 2k\pi + 2x \times$

$2x - \frac{7\pi}{18} = 2k\pi + \pi - 2x \rightarrow \boxed{x = \frac{k\pi}{2} + \frac{25\pi}{72}}$

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$\frac{\sin 4x + \sin 2x}{\sin 2x} - \sin^2 x = \cos^2 x \rightarrow \frac{2\cancel{\sin 2x}(\cos 2x + 1)}{\cancel{\sin 2x}} = \cancel{\cos^2 x - \sin^2 x} = \cos 2x$

$2\cos 2x + 2 = \cos 2x \rightarrow \cos 2x = -1$

$2x = 2k\pi + \pi \rightarrow x = k\pi + \frac{\pi}{2}$

$2x = 2k\pi - \pi \rightarrow x = k\pi - \frac{\pi}{2}$

$\boxed{x = k\pi \pm \frac{\pi}{2}}$

جواب ها در بازه $[-\pi, \frac{3\pi}{2}]$ ← 0 و π ← جواب سوال $\boxed{\pi}$ $= |\pi - 0|$

$$\frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \frac{1}{\sin\frac{x}{2}} + \cot\frac{x}{2} \to \frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} \to \sin^2\frac{x}{2} = \left(1+\cos\frac{x}{2}\right)^2$$

$$\cancel{1} - \cos^2\frac{x}{2} = \cos^2\frac{x}{2} + \cancel{1} + 2\cos\frac{x}{2} \to 2\cos^2\frac{x}{2} + 2\cos\frac{x}{2} = 0 \to 2\cos\frac{x}{2}\left(\cos\frac{x}{2}+1\right) = 0$$ ۶

$$\cos\frac{x}{2} = 0 \to \frac{x}{2} = 2k\pi \mp \frac{\pi}{2} \to x = 4k\pi \pm \pi \to \boxed{x = 4k\pi + \pi}$$

$$\cos\frac{x}{2} = -1 \to \frac{x}{2} = 2k\pi + \pi \to x = 4k\pi + 2\pi \to \boxed{x = 4k\pi}$$

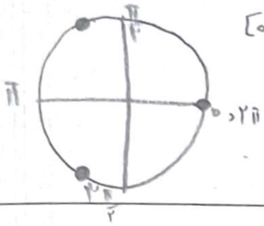
$$\cos^2 x - \sin^2 x\cos^3 x = 1 \to \cancel{1} - \sin^2 x - \sin^2 x\cos^3 x = \cancel{1}$$

$$-\sin^2 x\left(1+\cos^3 x\right) = 0$$

$\sin^2 x = 0 \to \sin x = 0 \to x = 2k\pi$

$\cos 3x = -1 \to 3x = 2k\pi + \pi \to x = \frac{2}{3}k\pi$ ۷

در بازه $[0, 2\pi]$



→ $\boxed{\text{جواب ۳}}$

$$\frac{1-\tan x}{1+\tan x} = \tan 3x \to \frac{\tan\frac{\pi}{4} - \tan x}{1+\tan\frac{\pi}{4}\tan x} = \tan\left(\frac{\pi}{4} - x\right) = \tan 3x$$

$$3x = k\pi + \frac{\pi}{4} - x$$ ۸

$$\boxed{x = \frac{k\pi}{4} + \frac{\pi}{16}}$$

$$\sqrt{1+\sin 2x} = \sqrt{2}\cos 2x \to \sqrt{\sin^2 x+\cos^2 x + 2\sin x\cos x} = \sqrt{(\sin x+\cos x)^2}$$

$$|\sin x + \cos x| = \sqrt{2}(\cos x - \sin x)\cancel{(\cos x+\sin x)} \to \frac{\sqrt{2}}{2} = \cos x - \sin x \leftarrow \sin+\cos>0$$

$$\to \frac{\sqrt{2}}{2} = \sin x - \cos x \leftarrow \sin+\cos<0$$ ۹

الف) $\sin^4 x - \cos^4 x = 1 \to \cancel{(\sin^2 x+\cos^2 x)}(\sin^2 - \cos^2) = 1 \to \cos^2 - \sin^2 = -1$

$\cos 2x = -1 \to 2x = 2k\pi + \pi \to x = k\pi + \frac{\pi}{2}$

$2x = 2k\pi - \pi \to x = k\pi - \frac{\pi}{2}$ در بازه $[0, 2\pi]$ → $\frac{\pi}{2}$ و $\frac{3\pi}{2}$

$$\sin^3 x - \cos^3 x = -1 \to (\sin x - \cos x)(\sin^2 x + \sin x\cos x + \cos^2 x) = -1 \quad (\sin x - \cos x)\left(1 + \frac{\sin 2x}{2}\right) = -1$$ ۱۰